What Is Claimed Is:

1. A method for actively controlling a physical variable of interest including the steps of:

a. measuring the physical variable;

b. generating a plurality of command signals over time based upon said physical variable measured in said step a and based upon a control weighting; and

c. varying the control weighting over time.

2. The method of claim 1 further including the steps of:

d. activating a plurality of force generators based upon said plurality of command signals.

3. The method of claim 2 wherein each of the plurality of command signals includes at least one command signal component associated with each of the plurality of force generators and the control weighting includes a plurality of control weighting components, each said control weighting component associated with one of the plurality of command signal components, and wherein said step c. further includes the step of varying more than one of said control weighting components.

4. The method of claim 3 further including the step of varying each of the control weighting components based upon a magnitude of the associated command signal component.

5. The method of claim 1 wherein each of the plurality of command signals includes a plurality of command signal components each associated with one of a plurality of force generators, and wherein the control weighting includes a plurality of control weighting components, each said control weighting component associated with one of the plurality of command signal components, and wherein said step c. further includes the step of varying each of the control weighting components based upon a magnitude of its associated command signal

component.

6. The method of claim 5 wherein the plurality of control weighting components include a first control weighting component greater than a second control weighting component.

7. The method of claim 1 wherein said step c. further includes the step of varying the control weighting based upon a magnitude of the plurality of command signals.

8. The method of claim 1 wherein the physical variable is measured by a plurality of sensors in said step a, said method further including the step of minimizing a performance index $J = z^H W_z z + u^H W_u u + v^H W_{\delta u} v$, where W_z, W_u and $W_{\delta u}$ are matrices for the control weighting on sensors z, control inputs u, and rate of change of control inputs v, respectively.

9. The method of claim 8 wherein the control weighting W_u is varied over time in said step c.

10. The method of claim 9 wherein the control weighting Wu comprises a plurality of control weighting components, each associated with one of a plurality of components of each of the plurality of control commands, the method further including the step of scaling each of the control weighting components based upon a magnitude of the associated control command component.

11. The method of claim 8 wherein the control weighting W_z is varied over time in said step c.

12. A method for reducing sensed physical variables including the steps of:
    a. generating a plurality of sensed signals as a function of physical variables;
    b. calculating a plurality of control commands as a function of the sensed signals;
    c. comparing each of the plurality of control commands to at least one maximum;
    d. reducing at least one of the plurality of control commands to a reduced control command based upon said step c.;
    e. recalculating the plurality of control commands other than the reduced control command based upon said step d. and based upon the reduced control command.

13. The method of claim 12 wherein the plurality of control commands are calculated in said steps b. and e. to minimize a performance metric that includes a sensed weighting on the plurality of sensed signals and a control weighting on the plurality of control commands.

14. The method of claim 13 wherein the performance metric further includes a weighting on a change in control command over time.

15. The method of claim 12 further including the steps of:
    f. computing the difference between the at least one control command and the reduced control command;
    g. estimating a difference in the sensed signals based upon the difference; and
    h. recalculating in said step e. based upon said difference in the sensed signals.

16. A system for controlling a physical variable comprising:

A plurality of sensors for measuring the physical variable;

A control unit generating a plurality of command signals over time based upon said physical variable and based upon a control weighting that varies over time; and

A plurality of force generators activated based upon said plurality of command signals.

17. The system of claim 16 wherein the control unit varies the control weighting based upon a magnitude of at least one of the plurality of command signals.

18. The system of claim 17 wherein the plurality of command signals includes at least one command signal component associated with each of the plurality of force generators and wherein the control weighting includes a plurality of control weighting components, each said component associated with one of the plurality of command signals, and wherein said step c. further includes the step of varying each of the control weighting components based upon a magnitude of the associated command signal.

19. The system of claim 18 wherein the control weighting components include a first control weighting component greater than a second control weighting component.

20. A computer readable medium storing a computer program, which when executed by a computer performs the steps of:

a. generating a first command signal based upon a measured physical variable and a control weighting;

b. changing the control weighting over time after said step a.;

c. generating a second command signal based upon the control weighting after said step b.

21. The computer readable medium of claim 20 which when executed by a computer further performs the steps of:

d. varying the control weighting based upon a magnitude of the first command signal.

22. The computer readable medium of claim 20, wherein the first command signal and second command signal each include at least one command signal component associated with each of a plurality of force generators, and wherein said step b. further includes the step of varying the at least one command signal for each of the force generators sequentially.

23. The computer readable medium of claim 22, wherein said step c. further includes the step of varying the control weighting based upon a magnitude of at least one of the plurality of command signals.

24. The computer readable medium of claim 23, wherein the plurality of command signals includes at least one command signal component associated with each of a plurality of force generators and wherein the control weighting includes a plurality of control weighting components, each said control weighting component associated with one of the plurality of command signal components, and wherein said step c. further includes the step of varying each of the control weighting components based upon a magnitude of the associated command signal.

25. The computer readable medium of claim 24 wherein the control weighting components include a first control weighting component greater than a second control weighting component.